Appl. No. 10/622,965
Examiner: Gourdreau, George, Art Unit 1763
In response to the Office Action dated July 5, 2005

Date: October 25, 2005
Attorney Docket No. 10112501

REMARKS

Applicant thanks the Examiner for acknowledging Applicant's claim to foreign priority and receipt of the certified copy of the priority document. Responsive to the Office Action mailed on July 5, 2005 in the above-referenced application, Applicant respectfully requests amendment of the above-identified application in the manner identified above and that the patent be granted in view of the arguments presented. No new matter has been added by this amendment.

Present Status of Application

Claims 9-20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the Applicant regards as the invention. Claims 1-5, 9-10, 12-13, 15-16 and 20 are rejected under 35 U.S.C. 102(e) as being anticipated by Chen et al (US 6,909,136). Claims 1-3, 5, and 7-8 are rejected under 35 U.S.C. 102(b) as being anticipated by Gruening et al (US 6,204,140). Claims 7-8, 10-11, 14 and 18-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chen et al. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gruening et al.

In this paper, claims 9, 11 and 20 are amended to remove the wording "predetermined". Claim 1 is amended to recite the step of "forming a mask layer in each deep trench and not covering the semiconductor substrate." Support for this amendment can be found on page 6, line 25 to page 7, line 3 and Fig. 2d. Claim 8 is amended to correct an informality in the dependency of the claim. Thus, on entry of this amendment, claims 1-20 remain in the application.

Reconsideration of this application is respectfully requested in light of the amendments and the remarks contained below.

Rejections Under 35 U.S.C. 112

Claims 9-20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the Applicant regards as the invention. More specifically, the Examiner finds the word "predetermined" to be vague and indefinite.

Applicant has amended claims 9, 11 and 20 to remove the wording "predetermined", and therefore believes that the rejections of claims 9-20 under 35 U.S.C. 112, second paragraph, are overcome. Withdrawal of the rejections of claim 9-20 under 35 U.S.C. 112 is respectfully requested.

Chen et al

Claims 1-5, 9-10, 12-13, 15-16 and 20 are rejected under 35 U.S.C. 102(e) as being anticipated by Chen et al. Claims 7-8, 10-11, 14 and 18-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chen et al. Applicant respectfully traverses the rejections for the reasons as follow.

The applied reference and the instant application have common inventors. Based upon the filing date of the reference, Chen et al constitutes prior art only under 35 U.S.C. 102(e). In this case, the rejection under 35 U.S.C. 102(e) may be overcome by a showing under 37 C.F.R. 1.132 that any invention disclosed but not claimed in the applied reference was derived from the inventors of the instant application, and is thus not the invention "by another." MPEP 2136.05.

The attached Declaration under 37 C.F.R. 1.132 executed by each of the inventors of the instant application states that the subject matter disclosed in column 3, line 53 to column 5, line 15 of Chen et al, and in the corresponding Figs. 1-4, describing a method of deep trench self-alignment, but not claimed in Chen et al, was derived from the inventors of the instant application.

As it is this subject matter which the Examiner relies upon in the rejections over Chen et al, Applicant respectfully requests that the rejections of claims 1-5, 7-16, and 18-20 be withdrawn and the claims passed to issue.

Gruening et al

Claims 1-3, 5, and 7-8 are rejected under 35 U.S.C. 102(b) as being anticipated by Gruening et al. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gruening et al. Applicant respectfully traverses the rejection for the reasons as follow.

As amended, claim 1 recites a deep trench self-alignment process for an active area of a partial vertical cell, comprising the steps of providing a semiconductor substrate having two deep trenches; forming a deep trench capacitor in each deep trench, lower than the top surface of the semiconductor substrate; forming an isolating layer covering each deep trench capacitor; ***forming a mask layer in each deep trench and not covering the semiconductor substrate***; forming a photoresist layer covering the semiconductor substrate between the deep trenches, wherein the mask layer surface is partially covered by the photoresist layer; etching the semiconductor substrate using the photoresist layer and the mask layers as etching masks to below the isolating layer; and removing the photoresist layer and the mask layers, wherein the pillared semiconductor substrate between the deep trenches act as an active area.

The Examiner relies on Gruening et al to teach a deep trench self-alignment process for an active area of a partial vertical cell.

Gruening et al fail to teach or suggest a deep trench self-alignment process for an active area of a partial vertical cell comprising the step of forming a mask layer in each deep trench and not covering the semiconductor substrate, as recited in claim 1.

To anticipate a claim, a reference must teach every element of the claim. In this regard, the Federal Circuit has held:

> "A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987).
>
> "The identical invention must be shown in as complete detail as is contained in the ... claim." *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989).

The method of a deep trench self-alignment process for an active area of a partial vertical cell in claim 1 comprises formation of the mask layer in each deep trench, wherein the mask layer is formed in the trench but does not cover the semiconductor substrate.

In the office action, the Examiner relies on element 44 of Gruening et al to teach the mask layer of claim 1. However, as acknowledged by the Examiner on page 4 of the office action, antireflective layer 44 is used to planarize the surface of the wafer. Namely, as described in column 4, lines 51-55 and FIGS. 5a-7b of Gruening et al:

> Next, a second material 44, here an anti-reflection layer, oxide, polynitride, or oxynitride, is deposited over the first material 42 and fills the under-filled recess to form a ***substantially planar surface over the semiconductor body***. [Emphasis added]

Thus, contrary to the invention of claim 1, the second material 44 taught in Gruening et al covers the semiconductor substrate. There is no teaching or suggestion of the step of forming a mask layer in each deep trench and not covering the semiconductor substrate, as recited in claim 1.

For at least the reasons described above, it is Applicant's belief that Gruening et al fail to teach or suggest all the limitations of claim 1. Applicant therefore respectfully requests that the rejection of claim 1 be withdrawn and the claim passed to issue. Insofar as claims 2-8 depend from claim 1 either directly or indirectly, and therefore incorporate all of the limitations of claim 1, it is Applicant's belief that these claims are also in condition for allowance.

Furthermore, with respect to the rejection of claim 6 under 35 U.S.C. 103(a) over Gruening et al, as it is Applicant's belief that claim 6 is allowable by virtue of its dependency from claim 1the Examiner's arguments in connection with these claims are considered moot and will not be addressed here.

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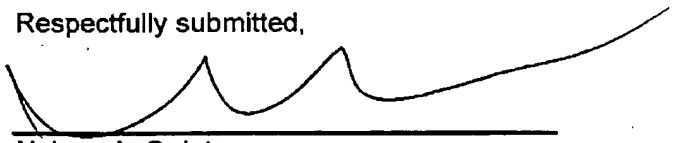
Conclusion

The Applicant believes that all the claims of the application are now in condition for allowance and respectfully requests so.

Respectfully submitted,



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